

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

Zhiqiang Wang et al.

Application No.: 10/667,313

Filed: September 23, 2003

For: TECHNIQUES FOR RESOLVING
NETWORK CONNECTIVITY

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) Group Art Unit: 2109
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) Examiner: Jeong S. Park
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) Appeal No.: _____
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SUBSTITUTE APPEAL BRIEF

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This appeal is from the decision of the Primary Examiner dated Oct. 5, 2007 finally rejecting claims 1-27, 29 and 30, which are reproduced as the Claims Appendix of this brief.

- ☐ A check covering the ☐ \$ 255 ☐ \$ 510 Government fee is filed herewith.
- ☒ The Appeal Fee of ☐ \$ 255 ☒ \$ 510 was charged to Deposit Account No. 08-2025 on April 7, 2008.

The Commissioner is hereby authorized to charge any appropriate fees under 37 C.F.R. §§1.16, 1.17, and 1.21 that may be required by this paper, and to credit any overpayment, to Deposit Account No. 02-4800.

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I. Real Party in Interest

The present application is assigned to Hewlett-Packard Development Company, L.P. Hewlett-Packard Development Company, L.P. is the real party in interest, and is the assignee of Application No. 0/667,313.

II. Related Appeals and Interferences

The Appellants' legal representative, or assignee, does not know of any other appeal or interferences which will affect or be directly affected by or have bearing on the Board's decision in the pending appeal.

III. Status of Claims

Claims 1-27, 29 and 30 remain pending and have been finally rejected and are the subject of this appeal.

IV. Status of Amendments

All prior amendments, including the last amendment filed July 20, 2007, have been entered. There are no pending amendments.

V. Summary Claimed Subject Matter

Pursuant to 37 C.F.R. §41.37(1)(c)(v), the subject matter of independent claims 1, 10, 21 and 27 and "means plus function claims 29 and 30 on appeal are cross-referenced to the specification and/or drawing figures in the following table. The following table is not to be construed as a representation that the portions of the disclosure identified below constitutes the sole basis for support for the claimed subject matter.

1. (Original) A method for resolving network connectivity, the method comprising:	Figs. 1-3
determining whether a first device is included in a portion of a network in which the first device can receive information directed to all devices included within the portion of the network;	Specification page 4, lines 13-16; Fig. 1, block 102
obtaining a first identifier associated with the portion of the network;	see paragraph [0015], lines 1-3 on specification page 4; Fig. 1 block 104
assigning a second identifier to the portion of the network unique to other portions of the network;	Paragraph [0017], specification page 5, lines 13-16; Fig. 1, block 106
modifying the first identifier associated with the portion of the network to include the second identifier; and	Paragraph [0018], specification page 5, line 22 - page 6, line 2; Fig. 1, block 108
associating the modified first identifier with the first device and the portion of the network.	Paragraph [0019], specification page 6, lines 5-7; Fig. 1, block 110
10. (Previously Presented) A system for resolving network connectivity, the system comprising:	Fig. 2
a memory; and	202
a processor, including:	204
logic configured to determine, using information data stored in the memory, whether a first device is included in a portion of a network in which the first device can receive information directed to all devices included within the portion of the network;	Specification page 4, lines 13-16; Fig. 1, block 102; 204; specification, page 8, paragraph [0025]
logic configured to obtain, from the memory, a first identifier associated with the portion of the network;	see paragraph [0015], lines 1-3 on specification page 4; Fig. 1 block 104; 204; specification, page 8, paragraph [0026];
logic configured to assign a second identifier to the portion of the network unique to other portions of the network;	Paragraph [0017], specification page 5, lines 13-16; Fig. 1, block 106; 204; specification page 9, paragraph [0027]
logic configured to modify the first identifier associated with the portion of the network to include the second identifier; and	Paragraph [0018], specification page 5, line 22 - page 6, line 2; Fig. 1, block 108; 204; specification page 9, paragraph [0028]

logic configured to associate the modified first identifier with the first device and the portion of the network.	Paragraph [0019], specification page 6, lines 5-7; Fig. 1, block 110; 204; specification page 9, paragraph [0029]
21. (Previously Presented) A computer readable storage medium containing storing therein a computer program for resolving network connectivity, wherein the computer program comprises executable instructions for:	Specification page 12, paragraph [0036]
determining whether a first device is included in a portion of a network in which the first device can receive information directed to all devices included within the portion of the network;	Specification page 4, lines 13-16; Fig. 1, block 102
obtaining a first identifier associated with the portion of the network;	see paragraph [0015], lines 1-3 on specification page 4; Fig. 1 block 104
assigning a second identifier to the portion of the network unique to other portions of the network;	Paragraph [0017], specification page 5, lines 13-16; Fig. 1, block 106
modifying the first identifier associated with the portion of the network to include the second identifier; and	Paragraph [0018], specification page 5, line 22 - page 6, line 2; Fig. 1, block 108
associating the modified first identifier with the first device and the portion of the network.	Paragraph [0019], specification page 6, lines 5-7; Fig. 1, block 110
27. (Previously Presented) A system for resolving network connectivity, the system comprising:	Fig. 2
means for determining a first identifier associated with a portion of a network in which a device can receive information directed to all devices included within the portion of the network;	Specification page 4, lines 13-16; Fig. 1, block 102; 204
means for determining a second identifier associated with the portion of the network unique to other portions of the network; and	Paragraph [0017], specification page 5, lines 13-16; Fig. 1, block 106; 204
means for associating the first and second identifiers with the device and the portion of the network,	Paragraph [0019], specification page 6, lines 5-7; Fig. 1, block 110; 204

wherein the means for associating comprises means for modifying the first identifier associated with the portion of the network to include the second identifier.	Paragraph [0018], specification page 5, line 22 - page 6, line 2; Fig. 1, block 108; 204
29. (PREVIOUSLY PRESENTED) The system of claim 27, comprising:	
means for presenting an association between the device and the portion of the network based on the first and second identifiers.	Specification page 10, paragraph [0031]; 206
30. (PREVIOUSLY PRESENTED) The system of claim 27, wherein the device comprises:	
means for storing the first identifier.	Specification page 8, paragraph [0026]; MIB 212

Appellants have disclosed a method and system for resolving network connectivity. As exemplified in Figures 1-3, and as recited in claim 1, a determination is made whether a first device is included in a portion of a network in which the first device can receive information directed to all devices included within the portion of the network (see specification page 4, lines 13-16; Figure 1, block 102).

For example, such a device is connected to a network by a switch, as opposed to being connected by a router. As described on specification page 1, paragraph [0002], lines 1-5, routers have been used to separate user devices into different broadcast domains. Routers use information in a data packet (e.g., specific address information) to route information to a specific destination device (paragraph [0003], lines 2-3).

In contrast, specification page 2, lines 19 et seq. (paragraph [0007]), describe that a device can be connected via a switch (e.g., Fig. 2 switch 208 and/or Fig. 3, switch 302) which logically partitions a network segment into a virtual local area network (VLAN). However, a VLAN which has been partitioned using a switch is not guaranteed to have VLAN identifier that is unique across all broadcast domains of the larger network within which they reside. In other words, a network that has been partitioned using a switch results in the device receiving information directed to all devices connected to the switch, and multiple VLANs can end up having the same VLAN identifier. For example, in Fig. 2, two different VLANs have the same identifier "VLAN 3". Consequently, devices of multiple VLANs may be treated by network management software as being part of the same VLAN. The network management software will therefore presume connectivity of devices which were not intended to be logically partitioned into the same broadcast domain.

Appellants have conceived an elegant solution to decreasing the significant latency which can be associated with transferring data packets using routers in a large network, and yet preserve the ability of network management software to accurately resolve connectivity of devices within the network. A first identifier is obtained which is associated with the portion of the network in which a first device is included (the first device being able to receive information directed to all devices included within the portion of the network) (see paragraph [0015], lines 1-3 on specification page 4; Fig. 1 block 104). In addition to obtaining the first identifier, a second identifier is assigned to the portion of the network unique to other portions of the network (paragraph [0017], specification page 5, lines 13-16; Fig. 1, block 106). The first identifier associated with the portion of the network is modified to include

the second identifier (paragraph [0018], specification page 5, line 22 - page 6, line 2; Fig. 1, block 108). The modified first identifier is associated with the first device and the portion of the network (paragraph [0019], specification page 6, lines 5-7; Fig. 1, block 110).

The foregoing features are broadly encompassed by independent claim 1 which recites "[a] method for resolving network connectivity, the method comprising: determining whether a first device is included in a portion of a network in which the first device can receive information directed to all devices included within the portion of the network; obtaining a first identifier associated with the portion of the network; assigning a second identifier to the portion of the network unique to other portions of the network; modifying the first identifier associated with the portion of the network to include the second identifier; and associating the modified first identifier with the first device and the portion of the network."

VI. Grounds of Rejection to be Reviewed on Appeal

- A. Whether Claims 1-5, 8-11, 13, 14, 17-24, 27, 29, and 30, Rejected Pursuant to 35 U.S.C. §102(e), Are Novel Over U.S. Patent Publication No. 2004/0213211 (Green)?
- B. Whether Claims 6, 7, 15, 16, 25 and 26, Rejected Pursuant to 35 U.S.C. §103(a), Are Patentably Distinct Over The Green Publication In View Of U.S. Patent No. 6,269,076 (Shamir et al)?
- C. Whether Claim 12, Rejected Pursuant to 35 U.S.C. §103(a), Is Patentably Distinct Over The Green Publication In view of U.S. Patent No. 6,026,442 (Lewis)?

VII. Argument

- A. Claims 1-5, 8-11, 13, 14, 17-24, 27, 29, and 30 Rejected Pursuant to 35 U.S.C. §102(e), Are Novel Over U.S. Patent Publication No. 2004/0213211 (Green).

In numbered paragraph 7 on pages 4-8 of the Office Action, independent claims 1, 10, 21 and 27, along with dependent claims 2-5, 8-9, 11, 13, 14, 17-21, 22-24 and 28-30, are rejected under 35 U.S.C. § 102(e) as being anticipated by Green (U.S. Patent Publication 2004/0213211).

The Green document is entitled "Method And Apparatus For Determining Shared Broadcast Domains Of Network Switches, Ports And Interfaces." This document is directed to identifying devices which refer to the same MAC address as being part of the same shared VLAN domain. This document is directed to determining shared domains, and is not directed to resolving network connectivity (e.g., resolving which devices are logically connected with one another where, for example, a given VLAN identifier is associated with more than one VLAN). As such, the Green document does not disclose, among other features, the feature of modifying the first identifier associated with the portion of the network to include the second identifier, as recited in Appellant's claim 1.

The Green document discloses a method to determine shared broadcast domains of a network based on learned features about ports or interfaces of the devices of the network using a Network Management System (NMS), such as the Marconi ServicesOn NMS. In the Final Office Action, the Examiner alleges that the MAC address of a device is equivalent to Appellant's claimed first identifier. One of ordinary skill in the art would have recognized that each MAC address of Green is universally specific to a given device, and thus would not have to have been

modified to resolve any connectivity issues. The MAC-to- Broadcast domain table shown in paragraph [0034] of the Green document illustrates that the MAC addresses are not modified. Other elements of this table, such as the Device ID, Port, VLAN ID and VLAN Name, are merely read from address forwarding tables and sorted. They are not modified. *See paragraphs [0028]-[0034].* The Green document simply does not disclose Appellant's claimed feature of modifying the first identifier associated with the portion of the network to include the second identifier. Accordingly, claim 1 is allowable over the Green document.

In response to the foregoing argument, the Examiner asserts that the Green document's disclosed use of both a MAC address and a "VLAN Name" constitute Appellants' claimed feature of "modifying the first identifier associated with the portion of the network to include the second identifier". The Examiner refers to Green's disclosure of the Marconi ServiceOn Data NMS system and asserts on pages 9-10 under heading "B" of the Final Office Action:

Marconis' ServiceOn Data NMS uses "High-level VLAN" term to describe the aggregation of individual device-specific VLANs on one or more directly connected devices that form a single broadcast domain (see, e.g., page 3, paragraph [0036] and [0037], wherein the individual device-specific VLANs are interpreted as the applicant's modified first identifier, which are combined identifier with MAC address (broadcasting domain is equivalent to the applicant's first identifier) and VLAN name (applicant's second identifier) (see e.g., page 3, paragraph [0035] to [0040] and table in page 3); and

Once the table (see, e.g., page 3, MAC-to-Broadcast Domain Table) has been built and it has been discovered which MAC addresses are not learned and therefore belong to individual switches and routers, the NMS can determine which ports or interfaces are used to connect these devices to one another (see, e.g., page 3, paragraph [0039]. which resolves the same problem of applicant's resolving network connectivity.

On page 10 of the Final Office Action, the Examiner concludes:

Therefore, the individual device-specific VLANs are obtained from the combination of the MAC address and the VLAN name (equivalent to the applicant's modifying the first identifier to include the second identifier) in order to determine network connectivity between one another network devices.

The Examiner's statements acknowledge the inability of the Green document to teach or suggest the presently claimed invention, because the "combination of the MAC address and the VLAN name" does not constitute a "modifying" of a first identifier associated with a portion of the network to include a second identifier as presently claimed, and Green is not directed to resolving network connectivity as presently claimed. For example, Appellants' paragraphs [0014], lines 1-4 on specification page 4 makes clear that the claimed "first device", and thus the "first identifier", is associated with a "portion" of a network which contains multiple devices. Claim 1 expressly states that the "portion" is one in which the "first device can receive information directed to all devices included within the portion of the network." Thus, the "first identifier" can not simply be an individual, device specific MAC address as alleged by the Examiner.

Moreover, paragraph [0018] on specification pages 5-6 explicitly states that the first identifier is modified by the second identifier "to create a conjunctive identifier"; see also page 6, which refers to string manipulation, mathematical operation, etc. No such "modifying" is disclosed or suggested by Green, as Green is not directed to resolving network connectivity where ambiguities may exist.

Appellants' claim 1 is therefore patentably distinct. Independent claims 10, 21 and 27 recite features similar to those of claim 1. Accordingly, these independent claims are also allowable over the Green document as well.

Dependent claims 2-5, 8-9, 11, 13-14, 17-20, 22-24 and 29-30 depend from independent claims 1, 10, 21 and 27. Accordingly, these dependent claims are allowable over the Green document.

B. Claims 6, 7, 15, 16, 25 and 26, Rejected Pursuant to 35 U.S.C. §103(a), Are Patentably Distinct Over The Green Publication In View Of U.S. Patent No. 6,269,076 (Shamir et al).

In numbered paragraph 5 on pages 6-7 of the Office Action, claims 6-7, 15-16 and 25-26 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the Green publication in view of Shamir et al. (U.S. Patent No. 6,269,076). Claims 6-7, 15-16 and 25-26 depend from independent claims 1, 10 and 21, respectively, and these independent claims are allowable over the Green document.

There would have been no motivation or suggestion to have combined features of the Green document with features of the Shamir patent in the manner suggested by the Examiner. The Shamir patent is directed to resolving split VLANs, and the Examiner has not established a *prima facie* case of obviousness by merely asserting as an unsubstantiated conclusion that it would have been obvious to use the features disclosed by Shamir, when resolving split VLANs, within the system disclosed by Green where split VLANs are not at issue.

Moreover, even if features of the Green and Shamir documents could have been combined in the manner suggested by the Examiner, the presently claimed invention would not have resulted. The Shamir patent simply does not cure the a forementioned deficiencies of the Green document.

Accordingly, independent claims 1, 10 and 21, and dependent claims 6-7, 15-16 and 25-26, are allowable over the Examiner's suggested combination of the Green document and the Shamir patent.

C. Claim 12, Rejected Pursuant to 35 U.S.C. §103(a),
Is Patentably Distinct Over The Green Document In view of U.S.
Patent No. 6,026,442 (Lewis).

In numbered paragraph 6 on pages 7-8 of the Final Office Action, claim 12 is rejected under 35 U.S.C. § 103(a) as being unpatentable over the Green document in view of Lewis et al. (U.S. Patent No. 6,026,442).

There would have been no motivation or suggestion to have combined features of the Green document with features of the Lewis patent in the manner suggested by the Examiner. The Lewis patent is directed to network surveillance and the Examiner has not established a *prima facie* case of obviousness by merely asserting as an unsubstantiated conclusion that it would have been obvious to use the features disclosed by Lewis, for network surveillance, within the system disclosed by Green where a determination of shared broadcast domains is at issue.

Moreover, even if features of the Green and Lewis documents could have been combined in the manner suggested by the Examiner, the presently claimed invention would not have resulted. The Lewis patent simply does not cure the aforementioned deficiencies of the Green document.

Accordingly, dependent claim 12, which recites further distinguishing features, is allowable over the combination of the Green document and the Lewis patent. Appellants respectfully request that the rejection of claim 12 based on the Green document and the Lewis patent be withdrawn.

D. Conclusion

Appellants request reversal and withdrawal of the Examiner's Final Rejection of claims 1-27, 29 and 30.

VIII. Claims Appendix

See attached Claims Appendix for a copy of the claims involved in the appeal.

IX. Evidence Appendix

See attached Evidence Appendix for copies of evidence relied upon by Appellant.

X. Related Proceedings Appendix

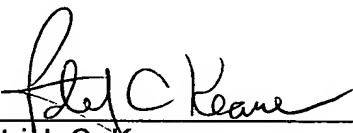
See attached Related Proceedings Appendix for copies of decisions identified in Section II, supra.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

Date May 22, 2008

By:



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VIII. CLAIMS APPENDIX

The Appealed Claims

1. (ORIGINAL) A method for resolving network connectivity, the method comprising:

determining whether a first device is included in a portion of a network in which the first device can receive information directed to all devices included within the portion of the network;

obtaining a first identifier associated with the portion of the network;

assigning a second identifier to the portion of the network unique to other portions of the network;

modifying the first identifier associated with the portion of the network to include the second identifier; and

associating the modified first identifier with the first device and the portion of the network.

2. (ORIGINAL) The method of claim 1, comprising:

identifying a second device included in the portion of the network; and

associating the modified first identifier with the second device.

3. (ORIGINAL) The method of claim 1, comprising:

presenting a first symbol identifying the first device, connected to a second symbol identifying the portion of the network using the modified first identifier.

4. (ORIGINAL) The method of claim 1, wherein the portion of the network is a broadcast domain.

5. (ORIGINAL) The method of claim 1, wherein the portion of the network is a Virtual Local Area Network (VLAN).

6. (ORIGINAL) The method of claim 5, wherein the first device is a network switch including a Management Information Base (MIB) configured to store an identifier of the VLAN.

7. (ORIGINAL) The method of claim 6, wherein obtaining the first identifier associated with the portion of the network comprises:

using a Simple Network Management Protocol (SNMP) query to obtain the identifier of the VLAN from the MIB as the first identifier.

8. (ORIGINAL) The method of claim 1, wherein the first device is a port included in a network switch.

9. (ORIGINAL) The method of claim 1, wherein the first device is coupled to other portions of the network by a network router.

10. (Previously Presented) A system for resolving network connectivity, the system comprising:

a memory; and

a processor, including:

logic configured to determine, using information data stored in the memory, whether a first device is included in a portion of a network in which the first device

can receive information directed to all devices included within the portion of the network;

logic configured to obtain, from the memory, a first identifier associated with the portion of the network;

logic configured to assign a second identifier to the portion of the network unique to other portions of the network;

logic configured to modify the first identifier associated with the portion of the network to include the second identifier; and

logic configured to associate the modified first identifier with the first device and the portion of the network.

11. (Previously Presented) The system of claim 10, wherein the processor comprises:

logic configured to identify, using information the data stored in the memory, a second device included in the portion of the network; and

logic configured to associate the modified first identifier with the second device.

12. (ORIGINAL) The system of claim 10, comprising:

a display;

wherein the processor comprises logic configured to present on the display a first symbol identifying the first device, connected to a second symbol identifying the portion of the network using the modified first identifier.

13. (ORIGINAL) The system of claim 10, wherein the portion of the network is a broadcast domain.

14. (ORIGINAL) The system of claim 10, wherein the portion of the network is a Virtual Local Area Network (VLAN).

15. (ORIGINAL) The system of claim 14, wherein the first device is a network switch including a Management Information Base (MIB) as a portion of the memory, the MIB being configured to store an identifier of the VLAN.

16. (ORIGINAL) The system of claim 15, wherein obtaining the first identifier associated with the portion of the network comprises:

using a Simple Network Management Protocol (SNMP) query to obtain the identifier of the VLAN from the MIB as the first identifier.

17. (Previously Presented) The system of claim 15, wherein the data information stored in the memory used in determining whether the first device is included in the portion of the network includes a first table having an entry associating an identifier of the network switch with the identifier of the VLAN.

18. (ORIGINAL) The system of claim 15, wherein the memory includes a second table having an entry associating an identifier of the network switch with the second identifier.

19. (ORIGINAL) The system of claim 10, wherein the first device is a port included in a network switch.

20. (ORIGINAL) The system of claim 10, wherein the first device is coupled to other portions of the network by a network router.

21. (Previously Presented) A computer readable storage medium containing storing therein a computer program for resolving network connectivity, wherein the computer program comprises executable instructions for:

determining whether a first device is included in a portion of a network in which the first device can receive information directed to all devices included within the portion of the network;

obtaining a first identifier associated with the portion of the network;

assigning a second identifier to the portion of the network unique to other portions of the network;

modifying the first identifier associated with the portion of the network to include the second identifier; and

associating the modified first identifier with the first device and the portion of the network.

22. (Previously Presented) The computer readable storage medium of claim 21, wherein the computer program comprises executable instructions for:

identifying a second device included in the portion of the network; and

associating the modified first identifier with the second device.

23. (Previously Presented) The computer readable storage medium of claim 21, wherein the computer program comprises executable instructions for:

presenting a first symbol identifying the first device, connected to a second symbol identifying the portion of the network using the modified first identifier.

24. (Previously Presented) The computer readable storage medium of claim 21, wherein the portion of the network is a Virtual Local Area Network (VLAN).

25. (Previously Presented) The computer readable storage medium of claim 24, wherein the first device is a network switch including a Management Information Base (MIB) configured to store an identifier of the VLAN.

26. (Previously Presented) The computer readable storage medium of claim 25, wherein in obtaining the first identifier associated with the portion of the network, the computer program comprises executable instructions for:

using a Simple Network Management Protocol (SNMP) query to obtain the identifier of the VLAN from the MIB as the first identifier.

27. (Previously Presented) A system for resolving network connectivity, the system comprising:

means for determining a first identifier associated with a portion of a network in which a device can receive information directed to all devices included within the portion of the network;

means for determining a second identifier associated with the portion of the network unique to other portions of the network; and

means for associating the first and second identifiers with the device and the portion of the network,

wherein the means for associating comprises means for modifying the first identifier associated with the portion of the network to include the second identifier.

28. (CANCELED)

29. (PREVIOUSLY PRESENTED) The system of claim 27, comprising:

means for presenting an association between the device and the portion of the network based on the first and second identifiers.

30. (PREVIOUSLY PRESENTED) The system of claim 27, wherein the device comprises:

means for storing the first identifier.

IX. EVIDENCE APPENDIX

None

X. RELATED PROCEEDINGS APPENDIX

None